

(CHEM 101 - CHEM 103)

FIRST SEMESTER

SECOND EXAM-II

(1438-1439H) (2017-2018G)



COLLEGE OF SCIENCE

Chemistry Department

Student's Name:	Write your answer in the table below			
	Q1:	Q6:	Q11:	
Student ID No.	Q2:	Q7:	Q12:	
Group No.	Q3:	Q8:	Q13:	
Saturday 14/03/1439H	10:30-12:00 pm	Q4:	Q9:	Q14:
Time allowed : 90 minutes	Q5:	Q10:	Q15:	

IA																	VIIIA
1	2											13	14	15	16	17	2
H	He											III A	IV A	V A	VIA	VII A	He
1.008	I A											5	6	7	8	9	10
3	4											B	C	N	O	F	Ne
6.94	9.01											10.811	12.01	14.01	16.00	19.00	20.18
11	12	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Na	Mg	III B	IV B	V B	VIB	VII B		VIII B		IB	IIB	Al	Si	P	S	Cl	Ar
23.00	24.31											26.98	28.09	30.97	32.07	35.45	39.98
19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
39.09	40.08	44.96	47.87	50.94	52.00	54.94	55.85	58.93	58.69	63.546	65.41	69.72	72.64	74.9216	78.96	79.90	83.80
37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
85.47	87.62	88.91	91.23	92.91	95.94	[98]	101.07	102.91	106.42	107.87	112.41	114.82	118.71	121.760	127.60	126.90	131.29
55	56	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86
Cs	Ba	Lu	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn
132.91	137.33	174.97	178.49	180.95	183.84	186.21	190.23	192.22	195.08	196.97	200.59	204.38	207.2	208.980	[209]	[210]	[222]
87	88	103	104	105	106	107	108	109	110	111	112	113					
Fr	Ra	Lr	Rf	Db	Sg	Bh	Hs	Mt	Ds	Rg	Uub	Uut					
[223]	[226]	[262]	[261]	[262]	[266]	[264]	[269]	[268]	[271]	[272]	[285]	[286]					

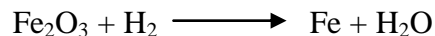
Constants:

$$1 \text{ atm} = 760 \text{ torr} = 101.325 \text{ kPa}$$

$$R = 0.0821 \text{ atm L mol}^{-1} \text{ K}^{-1}$$

$$N_A (\text{Avogadro's Number}) = 6.022 \times 10^{23} \text{ mol}^{-1}$$

Q1: When the following equation is balanced:



the coefficient of H_2 , is:

- A) 5
- B) 4
- C) 2
- D) 3
- E) 1

Q2: The mass (in g) of "O" present in 5.0 g of " $\text{K}_2\text{Cr}_2\text{O}_7$ ", is:

- A) 1.1
- B) 1.9
- C) 0.5
- D) 2.4
- E) 2.9

Q3: The percentage by mass of "Pt" in [$\text{C}_6\text{H}_{12}\text{N}_2\text{O}_4\text{Pt}$], is:

- A) 52.55 %
- B) 21.78 %
- C) 61.89 %
- D) 15.44 %
- E) 33.24 %

Q4: The number of calcium atoms "Ca" present in 0.5 g of " $\text{Ca}_2\text{P}_2\text{O}_7$ ", is:

- A) 3.79×10^{23}
- B) 3.11×10^{22}
- C) 2.37×10^{21}
- D) 4.51×10^{22}
- E) 4.26×10^{21}

Q5: A compound contains 63.68% C, 12.38% N, 9.80% H, and 14.14% O by mass. The empirical formula of this compound is:

- A) $\text{C}_2\text{H}_8\text{N}_2\text{O}$
- B) $\text{C}_8\text{H}_{15}\text{NO}$
- C) $\text{C}_7\text{H}_{13}\text{NO}_2$
- D) $\text{C}_6\text{H}_{11}\text{NO}$
- E) $\text{C}_9\text{H}_{18}\text{N}_2\text{O}_3$

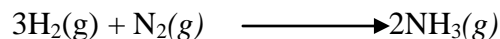
Q6: Given the following reaction:



If 25.5 g of " Fe_2O_3 " react with 3.3 g of "C", the mass (in g) of "Fe", is:

- A) 23.94
- B) 10.68
- C) 13.80
- D) 28.78
- E) 17.85

Q7: Given the following reaction:



If the reaction has a 88.7% yield, then the mass (in g) of H_2 needed to produce 120 g of " NH_3 " is:

- A) 18.09
- B) 24.01
- C) 13.67
- D) 27.42
- E) 36.87

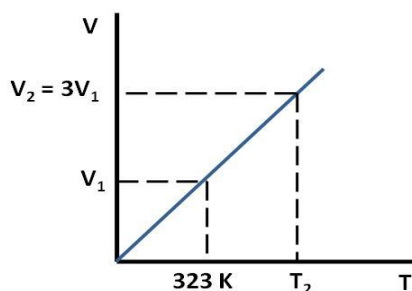
Q8: The molarity "M" (in mol.L^{-1}) of a solution prepared by dissolving 158.0 g of " $(\text{NH}_4)_2\text{SO}_4$ " in enough water to make 1250 mL solution, is:

- A) 0.96
- B) 1.24
- C) 0.29
- D) 0.48
- E) 1.63

Q9: At constant temperature, a sample of gas occupies 5.0 L at 0.98 atm. If the pressure becomes 3.25 atm, the gas volume (in mL) will be :

- A) 1252
- B) 2186
- C) 1508
- D) 2889
- E) 3896

Q10: The diagram below shows the change in volume (V) with temperature (T) of an ideal gas at constant pressure (P) and number of mole (n):



The final temperature (in °C) is:

- A) 969
- B) 742
- C) 498
- D) 415
- E) 696

Q11: The density (in g/L) of "CO₂" gas at -78 °C and 0.98 atm, is:

- A) 1.98
- B) 2.70
- C) 1.25
- D) 2.38
- E) 3.11

Q12: The volume (in L) of 2.41×10^{24} "NO₂" molecules at STP, is:

- A) 89.7
- B) 34.1
- C) 22.4
- D) 11.5
- E) 67.7

Q13: A 1.995 g of an ideal gas occupies 1.0 L at 20 °C and 1.5 atm. The molar mass (in g.mol⁻¹), is:

- A) 16
- B) 46
- C) 40
- D) 32
- E) 54

Q14: A sample of gas mixture at 750 torr contains 70.0 g of "He" and 30.0 g of "Ar". The partial pressures (in torr) of "He" gas is:

- A) 31
- B) 375
- C) 719
- D) 525
- E) 225

Q15: A gas sample has a pressure of 1.2 atm at 25°C. If the temperature changes to -23 °C, the final pressure (in atm) of gas, is:

- A) 0.75
- B) 0.50
- C) 1.50
- D) 1.75
- E) 1.00

